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THE FUEL PROBLEM OF CANADA

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The Fuel Problem of Canada

By

MARTIN NORDEGG

"Nullus est liber
tam malus
Ut non alique parte
prosit."

—Plinius

THE MACMILLAN COMPANY OF CANADA
LIMITED, AT ST. MARTIN'S HOUSE, TORONTO
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PREFACE

"Out of the abundance of the heart, the mouth speaketh."

THE idea of presenting to the public an economic monograph of the Fuel Problem of Canada originated from a casual remark by The Honourable R. B. Bennett, K.C., M.P., the Leader of the Conservative Party, to the author.

The first question was to decide for whom this book should be written. There was no need to write it for the mining industry. But, although the question has occupied the public for many years, by discussions in Parliament and comments in the press, no attempt has been made to arouse national interest in the great importance of the entire problem. Hence this book, which is intended for the public. It was a task of condensing the voluminous material, eliminating technical matters and comprehensive statistics, and yet explaining clearly the problem which

Canada is facing, and suggesting possible solutions. This task was greatly facilitated by the willingness, even enthusiasm, of those who by their knowledge and studies of the conditions were fully aware of the present unfortunate state of affairs.

Thanks are especially due to the Honourable Charles Stewart, Minister of the Interior and Mines; to Dr. Charles Camsell, Deputy Minister of Mines; to Mr. F. G. Neate, Secretary of the Fuel Board; to Mr. B. F. Haanel, Chief Engineer of the Department of Mines; to Mr. R. H. Coats, Dominion Statistician and to Mr. Frank Wheatley, President of the Mine Workers Union of Canada.

As this presentation will doubtless result in discussions and polemics, even contradictions, its main purpose will be attained, namely to stir up a greater interest in the problem; and after weighing the possible animosity, perhaps even attacks, which the author will encounter from quarters not able to stand just criticism, he nevertheless has the courage to tell the truth, as he finds it.

And if any of the proposed or other remedies be examined, accepted or improved, or are actually carried into effect, the author will feel amply rewarded for his effort, upon which he embarked as a token of gratitude to his adopted country.

MARTIN NORDEGG.

Ottawa, Ontario,
July 15, 1930.

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PART I

THE PRESENT STATE OF THE FUEL PROBLEM

INTRODUCTORY

MAN has accomplished much. He has succeeded in changing even the discomforts of the climate by using fuel to supply heat.

Of the different kinds of fuel, coal is the most important.

The invention of the steam engine brought coal to the throne.

Coal became the creator and mighty ruler of an ever growing kingdom ''Industry'', moved by power.

But nothing is lasting in this ever-changing world, and in the Kingdom of Coal a revolution broke out.

The leaders of this revolution are Petroleum, Hydro-Electric Power and improved economical methods.

The coal-producers of the whole world are suffering from this revolutionary movement which eliminates a considerable number of skilled workmen and destroys invested capital.

The coal problem of Great Britain has received public attention through the struggles in her political life and she has not yet solved that problem.

Europe is attempting to rehabilitate her coal industry by introducing modern chemical and engineering methods, with a view to extending its markets.

In the populated area of Canada—a long but very narrow ribbon stretching from the Atlantic to the Pacific Ocean—the supply of fuel is an economic problem of the first magnitude.

Fuel is of vital importance to the entire nation. It is one of the chief essentials of life.

Fuel concerns everybody's welfare, comfort and pocketbook.

Fuel enters into the production of everything in one way or another.

The economic and industrial utilisation of Canada's coal resources, which, not long ago, were considered to be one of her most valuable natural resources, now constitutes a problem which must be solved but, apparently, the public is unaware of this grave situation.

Coal is an especially important economic factor in Nova Scotia, Alberta and British Columbia. But the structure of the entire Dominion is affected by this problem.

This is not based on a theory.

It is an actual condition which—if not remedied—will result in continually increasing economic losses to the entire country.

It constitutes a National Problem, which can be solved only by a sane National Policy.

The Liberal Party has always exhibited the greatest concern in this question.

The Conservative Party is already pledged to a Fuel Policy.

The newly elected Government of the Dominion should confront the first session of the 17th Parliament with a practical proposition to ameliorate this critical condition by taking energetic steps towards a solution of the problem.

In trying to improve conditions, there must not and there will not be any opposition from any political body or individual who has the interest of Canada at heart.

And who has not?

CHAPTER I

FUEL, THE GOVERNMENT AND THE NATION

"The first step toward protection of the public interest is a better public understanding of the coal business. Guided by facts rather than rumours, by information rather than prejudice, the people will be able to exercise wisely the powers of the government."

United States Coal Commission.

COAL, Petroleum, Natural Gas, Peat and Wood are the fuels of the domestic world.

Coal, Petroleum, Gasolene and Electricity are the motive forces of the industrial world, and by economical methods, as well as inventions, the cost of producing power is steadily falling.

Why has Canada a fuel problem?

Because her coalfields are located too far from their markets, and her own supply of other fuels is insufficient, and transportation to certain regions is not economical.

The Governments of the Dominion and Provinces are fully aware of these difficulties. Several investigations have been made. Most attempts at remedy were caused through local pressure by the coal industry, and where actual help was granted, it was mainly, perhaps exclusively, for local political reasons. But generally even an attempt at a solution was shifted from one Government to another, and all attempts died as usual.

It seems lately as if the Provincial Governments were getting more powerful, and consequently the Dominion Government weaker. If that is true it will be more difficult to carry out a National Fuel programme.

What has actually been done by the Governments?

In 1917 the greatly increased demand for coal for war purposes necessitated the appointment of a Fuel Controller, who was authorised to make regulations, subject to the approval of the Governor-in-Council, governing the price of coal, wood and gas, and the production, distribution, sale, delivery, consumption and use thereof.

His final report was submitted in 1919. It contained a survey of the general fuel situation throughout Canada. By way of recommendation, the report pointed out, "that because the whole fuel question is one of such vital importance to the Canadian people, there should be some body of men following it very closely, whose functions would be to advise when and where certain methods were capable of practical application to the various centres of Canada."

Then followed, one after another, three investigations by Committees of the House of Commons, one by a Committee of the Senate, one by the Tariff Board.

Once, in 1923, matters became so serious, that public interest demanded action. The following admirable resolution was referred to the Select Standing Committee on Mines and Minerals, of the House of Commons, on Canadian Fuel Supply:

> "That in the opinion of this House, the time has arrived for Canada to have a National Policy in relation to its coal supply and that no part of Canada should be left dependent on a United States coal supply. And that the whole question of fuel supply for Canada, together with the question of cost, transportation, desirable interprovincial action and other means whereby Canada may be self-sustaining and self-supplying as regards fuel and to inquire into the necessity and possibility of supplying substitutes for coal be referred to the Standing Committee on Mines and Minerals and that said Committee report to the House."

The Committee heard much evidence from various parts of Canada on many phases of the question submitted to it in the resolution.

The report of the Committee stated: *that it is absolutely necessary that every step possible should and must be taken at once by Canada through its Government, its transportation companies, its coal operators and manufacturers of other fuels, to make Canada independent of other countries for its fuel sup-*

ply. The economic question alone should move all Canadians to put forth every exertion to attain this object.

If ever a question of national welfare, of national importance, was shelved, it was this resolution.

And there was no subsequent storm of protest, no public and nation-wide expression of indignation.

The Government of Alberta appointed a Royal Commission to investigate the coal mining industry in 1924.

The Government of Nova Scotia followed with a similar investigation in 1925.

The Royal Commission on Maritime Claims, appointed in 1926, devoted a part of its investigations to Nova Scotia coal.

The Duncan Coal Commission recommended to the Government of Nova Scotia the establishment of coking plants to mitigate unemployment, and to take immediate practical steps towards their establishment by Federal authorities.

A special committee was appointed by the House of Commons in 1926 to investigate the coal resources of Canada.

In its report, the Committee expressed the opinion that although much valuable evidence and important data had been obtained, their investigation had, *through lack of time,* not covered the situation as fully as the Committee had hoped. The Committee was also of the opinion that this investigation ought to be resumed and continued at as early a date as possible next session of Parliament.

None of these investigations touched the kernel of the problem, nor did they go beyond mere recommendations.

The only actual result was the creation by the Dominion Government of the Dominion Fuel Board, as a standing body. But its functions were and still are restricted to acting only in an advisory capacity to the Government. Unfortunately the public hardly knows of its existence, and less of its valuable findings. How can any Board or fact-finding Commission of such importance function on an appropriation of less than $20,000 annually?

Many times local demands were made by the coal industry and whenever it suited the "powers that were", inadequate and pacifying temporary relief was granted as a kind of charity or soporific. The general public eventually lost interest in the problem, shook its head and went to sleep again.

From time to time it was aroused from its slumbers, and quickly calmed by the creation of various new and very promising institutions. Let us consider what they are or were and we will leave it to a benevolent imagination to pass judgment on their accomplishments.

1. The Commission of Conservation

The Conservation of Natural Resources was its broad task, and the Coal Resources naturally fell under its scope.

Very little of value was accomplished during its short period of existence.

2. The Honorary Advisory Council for Scientific and Industrial Research

The Council was formed in 1917.

The Research Council Act of 1924 provides as one of its general powers: "*i.* to promote the utilisation of the natural resources of Canada." How far has the Research Council fulfilled its authority—which entails also an obligation—in regard to one of Canada's most important natural resources?

Its first action in 1917 was to follow the recommendation of the Fuel Committee in establishing the Lignite Utilisation Board.

3. The Lignite Utilisation Board

The Board was established in 1917 for the purpose of demonstrating *commercially* the feasibility of carbonising and briquetting lignites. Consequently the Dominion and two Provincial Governments financed the establishment of a plant at Estevan, Sask. Nearly three quarters of a million dollars were spent on this futile attempt which is one of the most tragic experiments carried out on a large scale. The plant is now taken over by commercial interests who changed the process and are producing briquettes, with still doubtful results.

4. The Peat Committee

This Committee was established in 1918. A plant was constructed at Alfred, Ont. It was financed by the Governments of the Dominion and the Province of Ontario to the extent of half a million dollars. The plant is now lying idle and all attempts to induce commercial interests to work it, have failed.

5. The Department of Trade and Commerce

The Department is apparently only interested in the fuel trade as far as it administers the Dominion Bureau of Statistics, whose very instructive statistics form an exceedingly lucid picture of the fuel situation.

6. The Alberta Coal Commission

Very little is known of its achievements. But high praise is due to the Trade Commissioner, Howard Stutchbury, who started an educational campaign for the use of Alberta coal, providing demonstration plants in various cities. Probably on account of the expenses involved, this campaign was not continued, and its former success on the Winnipeg market is now again endangered by increased importations of United States coal and coke.

The endeavour to place Alberta coal into the highly competitive markets of Ontario was predestined to economic failure, notwithstanding the reduced railway rate.

7. The Department of Mines, Division of Fuel Research

This Department, as universally recognised, carries out most useful research work. It studies the improvements made all over the world connected with fuel and publishes its findings, which should prove of great value to the industry. Special attention is directed to the valuable contribution by Mr. B. F. Haanel to the World's Power Conference in Berlin in 1930.

8. The Ontario Research Foundation

This institute was formed for the promotion of research into methods of improving production in the various industries.

In carrying out experiments on Northern Ontario Lignite, it is probably duplicating the efforts of the Mines Branch in Ottawa which is fully equipped to carry out all such tests.

9. The Scientific and Industrial Council of Alberta

The University of Alberta, Edmonton, is to be complimented on its interest in Alberta fuels, and more recently in regard to the utilisation of the Alberta Tar Sands.

10. The Nova Scotia Board of Fuel Investigations

This Advisory Board was formed in 1927 for the purpose of advising the Government of Nova Scotia in regard to extending the use of Nova Scotia coal. It is composed of representatives of various interests and thus constitutes the first attempt at cooperation.

These technical Research Institutes could be of the greatest importance. The necessity for a central body to coordinate efforts, distribute problems, avoid unnecessary duplications and overlappings, is obvious. This would insure constant collaboration, at least regular exchange of views between the Research Institutes.

The National Research Council, it is hoped, will assist to its utmost power these valuable researches, and enlist cordial cooperation of the world's scientists and scientific bodies in the special phases which the Fuel Problem of Canada offers.

The whole Fuel Question has never been grasped in its entirety.

The consequence is a tangled mass of knotty, lesser problems, none of which has so far been solved.

There is only one way out, and that is a ruthless slashing through this Gordian knot.

What are the aids given hitherto by the Dominion Government?

Briefly:—

1. The Domestic Fuel Act of the Dominion of 1927 passed for the purpose of encouraging the use of Canadian coal in the manufacture of coke. The subsidy provides for annual bounty payments up to $1.00 per ton, over a period not exceeding 15 years. Has it helped? Hardly. The Montreal Coke Corporation still prefers importing all its coal from the United States and has not used coal from Nova Scotia.

   The drawback of 99% on imported bituminous coal for the manufacture of coke in by-product coke ovens is a contradictio per se.
2. The preferential freight rate for Alberta

domestic coal to Ontario has hardly shown encouraging results. The shipments are negligible, compared with the importation of United States coal into Ontario.

3. Nova Scotia coal has preferential freight rates on coal from St. Lawrence ports to points in Quebec and Ontario, at one fifth of one per cent. per mile.
4. Nova Scotia coal has a blanket freight rate of $3.00 per ton from the mines to Quebec during the winter.
5. New Brunswick coal has a blanket freight rate of $2.10 per ton from the mines to Quebec during the winter.
6. Quite recently, assistance on freight rates has been given to Western bituminous coal of $1.00 per ton to Manitoba.
7. Quite recently, assistance on freight rates has been given to Saskatchewan lignites of 50 cents per ton to Manitoba.

And this is all.

H. L. Keenleyside says in *Canada and the United States*: "Canadian legislatures are prone to extend aid to industries in the form of bounties, loans or special assessment rates." Does this include the coal industry? Hardly.

In fact, Canadian coal is subject to a royalty on every ton of coal mined to the Provincial Governments, viz. to Nova Scotia of twelve and a half cents, to Alberta of five cents.

Besides this royalty, the mines of Alberta have to pay annually for lease of coal lands, one dollar per acre.

CHAPTER II

COALFIELDS AND COAL MINES

CANADA possesses one-sixth of the world's supply.

There are three regions of important coal deposits: Nova Scotia, Alberta and British Columbia.

In her coalfields, Canada possesses all varieties ranging from low grade lignites to semi-anthracite.

Her immense deposits have been estimated by the Geological Survey of Canada as follows:

Nova Scotia	9,719	Million	Metric	Tons
Saskatchewan (lignites)	59,812	"	"	"
Alberta	1,072,627	"	"	"
British Columbia	76,035	"	"	"

The Province of Nova Scotia

Includes the bituminous coalfields of *Cape Breton,* with 23 collieries producing five million tons annually. The price of this coal, if transported by water, makes it possible to compete successfully with United States and British coal in Eastern markets.

Pictou County with six collieries, producing about three quarter million tons annually. The freight rate to Eastern Quebec is too high for competition with foreign coal.

Cumberland County with three collieries could produce three quarter million tons annually, but during six summer months production is cut to less than half. This splendid domestic coal should find an extended market in the Province of Quebec. The freight rate is prohibitive. This district, though 300 miles nearer Montreal than Sydney, has—strange are the ways of freight rates—the same rate.

Minto District. Five collieries produce 175,000 tons annually. With a preferential summer rate, a part of the market of the Eastern Townships could be gained.

The Nova Scotia mines shipped in 1929 2.37 million tons to Quebec. The producing mines were working at 81 per cent. of their possible output.

The present trouble in the Maritime

Provinces is the seasonal uncertainty of work. It arises from the fact that cheap water transportation prevails only in summer. (In other provinces we find the summer to be the slack season.)

If the mines in the Maritimes could work to capacity all the year round—and this should be aimed at—it would be of the very greatest advantage, not only to the coal industry, but to industry in general.

THE PROVINCE OF SASKATCHEWAN

Includes the lignite coal fields of Souris district. Fourteen larger mines produce a total of about 500,000 tons annually.

This lignite coal contains 30 per cent. of water and therefore deteriorates quickly. Consequently it cannot be stored for any length of time without serious loss, and mining operations are only being carried on to supply the immediate demands of the market.

This situation resulted in the demand

for briquetting, but so far all efforts have been without economic results. The unfortunate experiment, financed by three Governments, has terminated by private interests taking over the plant. Under advice from the German Lurgi Company, the interests at present in control are using a different process. It still remains to be seen, if these experiments on a large commercial scale will prove economically sound.

The Province of Alberta

Is the richest coal province in the Dominion. Its total output in 1928 was 7½ million tons.

The Alberta coal mines produced 79 per cent. of their possible output in 1928.

The fluctuations of coal mining are evidenced by the number of wage earners. According to Mr. Frank Wheatley, in January 1928 there were 11,500 men employed, but in May 1928 only 6,800.

The ease with which Alberta lignite mines can be started, without investing much capital, is responsible for their large number. It is not exaggerating to say that as a consequence, the mines could produce, as they actually are, two and a half times as much as they can dispose of; and yet they work only a few weeks at full capacity during the cold season.

Many domestic coal mines are not managed economically. There is not sufficient attention paid to the preparation of coal. Coal with high ash content is carried into distant markets, and this worthless weight is being paid for by the consumer, in the price of coal and also in the freight charge.

The Drumheller lignite district furnishes a very clear picture of most uneconomic coal mining conditions.

The total output amounts to over one million tons. But only 6 mines produce over 100,000 tons annually, and 19 mines between 23,000 and 100,000 annually.

Many mines are at a standstill and the mining itself is entirely sporadic. If ever there was over-development, it is here, and yet new mines are being opened up in the face of cut-throat competition. Another disadvantage of this district is the mining of an inferior coal. The situation is very critical, and as a last resort to extend the market, a frantic appeal for a reduced freight rate was made. With better domestic coals available—which will store infinitely better—it is merely a question of an educational campaign to induce the public to buy a higher grade of coal.

Unless this district adopts very drastic measures of self help, by consolidation or other rational methods, the greatest part of its invested capital will be lost.

Though developing and installing bituminous mines demands more capital than lignite mines, far too many bituminous coal mines have been opened up, are over-capitalised and over-developed. Consequently, coal-mining, from the standpoint of capital, is not a lucrative venture any longer.

It has been estimated that the coal mining industry of Canada represents about 150 million dollars.

The quotations for shares of Dunsmuir Collieries, Crowsnest Pass Coal Company and Hillcrest Collieries on the Stock Exchange tell their own tale, and yet, new bituminous mines are continually opened up in Alberta.

At the close of the 16th Parliament, the Prime Minister of Canada promised action regarding the construction of a railway for the Peace River district as an outlet to the Pacific Coast.

Immediately an inspired article appeared in the newspapers, entitled "Help Coal Lands", stating that this railway will open up the high grade coal resources which are at present too remote for development.

This is a very interesting case to prove the fallacy of such a project. What is the eventual market for this coal? It cannot go East, because the mines on the Canadian National Railway near the Yellowhead Pass are already over-developed for a restricted market, besides enjoying a shorter haulage to the East. It cannot go West without encroaching on the Pacific market, supplied already by Vancouver Island coal—and this is being gradually, but constantly, replaced by fuel oil. Consequently, the only market available for this new mine would be the consumption by the railway itself, from the Eastern point where the Yellowhead coal competes, to a Western point where Vancouver coal—or perhaps United States fuel oil—competes.

It stands to reason that this announced project must spell disaster to the new mine as well as to some of those already in operation. This area should not be opened, as it proves neither a necessity for economic reasons, nor does it supply a fuel superior to the coal already available in the region. Even should strongest political influence be brought to bear, it should not induce the

Alberta Government to grant this permission.

That the Alberta coal industry as a whole did not stir against this proposal, is surprising. It still lacks foresight and co-ordination.

If we consider Alberta coal mines, we find that 399 mines were in operation in 1924, and only 281 in 1928; and yet the output of coal was five million tons in 1924 against over seven million tons in 1928. This shows that though nearly one-third of the mines have closed down, a larger output is recorded. Consequently it is clear, that there is neither need, nor any advantage in opening other mines; in the contrary, the closing of more mines would constitute a material improvement of the general situation of the coal industry.

The following extract from a report by Mr. Howard Stutchbury, Trade Commissioner for Alberta, is significant:

> "We are unfortunately in a position in Alberta of being over-mined not only in the

matter of production but in the matter of operating companies. Many of these companies are irresponsible to the extent that they only see the immediate market and its profit without thought to ultimate development either for themselves or for the industry at large.

The conservation of Alberta coal has been recommended by the Coal Mining Industry Commission. Large quantities of coal have been and are being lost through improper mining methods. It is recommended that before mining operations are commenced, the question of the advisability of opening a mine in any particular field as well as the question of capital required to open a field, be referred to and approved by the Coal Mining Industry Commission. The administration of the regulation passed by Order in Council P. C. 2303 by the Federal Government is vested in the above mentioned Commission."

SOUTHERN ALBERTA AND EASTERN BRITISH COLUMBIA

Includes the Crowsnest Pass bituminous coalfields with a total production of 2½ million tons annually. Lately, the United States railway market has practically been lost for this coal.

As the C.P.R. is using 80 per cent. of the output of these Crowsnest mines, and the greatest part only when the crop is moving, seasonal mining is therefore the result, which creates uneconomic conditions. The collieries are equipped and developed for a much larger production than the market requires.

WESTERN BRITISH COLUMBIA AND VANCOUVER ISLAND

Includes the inland district, producing 270,000 tons, and Vancouver Island, producing 1½ million tons. There is severe competition in this market by the constantly increasing importation of crude oil and the development of hydro-electric power. The formerly thriving trade in bunker coal is naturally lost by the use of oil.

CHAPTER III

DIFFERENT KINDS OF COAL

ANTHRACITE is used chiefly for domestic purposes.

Bituminous is used by railways and industries.

Lignite is used for domestic and restricted industrial purposes.

The public should know, for its own benefit, the constituents of the coal available in Canada.

B.T.U. means British Thermal Units and expresses the heat value.

	Moisture	Ash	Volatile	Carbon	B.T.U.
United States Anthracite	4	12	6	80	13,000
British Anthracite	2	4	8	88	14,600
Russian Anthracite	4	3	4	88	13,800
United States Bituminous (Pocahontas)	1.2	9	15.5	75	14,000
Nova Scotia Bituminous	3.3	3	35	60	14,000
Alberta Bituminous	4.9	6.7	32.7	55.7	11,700
Saskatchewan Lignite	33	7	27	32	7,300
Peat (Air-dried)	12.4	3	58	26.5	9,200

These figures are averages. Within these general classifications, there are of course, many variations according to the localities from which the coal emanates, and also from which seam the coal was taken.

The industry purchases mostly on contract and stipulates certain analysis.

But the domestic consumer cannot do that.

Although every coal dealer might inform his customer, on demand, of the analysis, in good faith, this does not always mean that the consumer actually receives coal of this standard.

In fact, the content of ash and slate is often much higher.

The consumer should have the right and facility of receiving exactly what he pays for.

This means that in future coal sold should bear a certificate of origin, ash-content and heat value, as well as of weight.

The public is already accustomed to buy staples by certified grade. Why not coal?

CHAPTER IV

THE MARKETING OF COAL

"We might pension off every superfluous middleman and yet society would not be poorer but richer as the result."

J. Ramsay Macdonald,
The Socialist Movement.

MOST of the bituminous coal is being consumed by the railways. They buy direct from the mines and carry the coal to their logical distribution points.

Several bituminous coal mines cater only to the railways, but some have been trying to supply industrial markets or municipal power plants, either selling direct to the consumer, or through wholesalers. The charges for these latter "paper transactions" vary from a moderate minimum to fifty cents a ton.

The distribution of sub-bituminous and lignite coal is almost entirely effected by wholesalers and retailers.

What benefit does a mine derive from employing a wholesaler to sell its coal?

The wholesaler offers no guarantee to buy a definite part of or the entire output. All that he does, is to sell as much coal from the mine to the retailers as he is able, and he is held responsible by the mine for his transactions. It is needless to point out the great risk assumed by the mine, by leaving to one wholesaler the responsibility of sales. The contact between operators and wholesalers is not sufficiently intimate to adjust delivery to the uniform output of the mine.

The reason why mines employ wholesalers to sell coal, is probably due to the usually great distance of the mines from the markets. A charge of about ten cents per ton would be much nearer the actual commission for effected sales, if a co-operative sale organisation be maintained by the mines themselves.

It is understood that one wholesaler disposes of coal from three domestic coal mines at the rate of 500,000 tons per year and charges up to 50 cents per ton. In this instance, if this is correct, this wholesaler reaps a tremendous and totally unjustifiable profit from his transactions. The staff of this particular wholesaler is small, and his expenses hardly conform to the charges exacted from the mines, or better said, from retailers who pass them on to the consumer.

The wholesaler disposes of carload lots to the retailer. The retailer handles the coal, dumping it generally in the most antiquated and inefficient manner, and reloading it on wagons or trucks for delivery to the consumers. He carries their accounts. It is rarely a straight cash transaction, and he has to assume carrying charges and risks. The spread between the purchase and the invoice price to the customer—exclusive of freight—is reported to be often as high as $3.00 per ton, or where delivery is made in bags, frequently as high as $3.50.

What is the actual significance of

this apparently exorbitant charge on the part of the retailer? If taken into consideration that production in the mine, cleaning, sizing, including labour, etc., and loading into the railway car actually amounts to about the same amount—then the public pays dearly for this necessity.

It is obvious that in this wholesale and retail distribution a great and immediate saving must be affected. Two groups of middlemen are making profits which can hardly be justified in comparing the actual price of coal at the mine with the selling and handling charges. These middlemen, as shown, are making exceedingly high profits, or else they would not stay in the business. The elimination of these profits would and should directly and immediately benefit the customer, and thus reduce the price of Canadian coal to the extent of materially reducing the consumption of foreign coal.

Further, acting both as wholesalers and retailers, there are lumber companies using their sheds and organisation for the disposal of coal to the public.

Besides these middlemen, there are co-operative farmers' associations disposing of coal to their members.

Except in a few big cities, these intermediate traders are not sufficiently well equipped for an up to date and economic handling of coal, resulting in material waste and serious deterioration.

In Winnipeg there are more than 100 coal dealers, of whom less than 25 control the market. There we find, not severe competition, but very ready understanding among the retailers, for their sole benefit and not particularly for that of the public.

And the result, as far as the customer is concerned, is that he has to accept quality, weight, heat value and price. And it is possible that he is ignorant of the correct way of using coal, with the result that a great amount of fuel is wasted.

Even the economical householder, uninformed as he is in regard to fuel values, takes the price of the fuel supplied to him for granted.

Commodities which he purchases daily, as staples, are subject to careful consideration and calculation, because he has a fair comparison as to standard.

But in regard to fuel, purchased only occasionally during the year, he has no standard and no control, at present.

CHAPTER V

THE RAILWAYS AND COAL

WHEN travelling on our railways, during a walk on the platform we look at the tender: what fuel does the engine use?

When we meet a freight train, carrying coal, whence does it come from and whither does it go?

The relations between the railways and the coal industry are twofold:

1. THE RAILWAYS AS CONSUMERS

The Railways are by far the greatest consumers of coal. Towards the Pacific Coast, railways find it to their advantage to burn oil, but otherwise depend upon the use of coal. How far hydro-electric development in the future may induce the Canadian railways to use electricity, is difficult to say.

It is known that the two great Canadian railways used in 1928 not less than 10 million tons of coal, but it may not be known that only half came from Canadian mines.

As both systems are naturally operated on the most economic lines, there can not be any doubt that there exist important reasons after intense study, which induce the railway companies to use foreign coals.

In fact, both systems have found it advisable to own and operate their own coal mines in the United States, for use in Canada. As far as the Canadian National Railway is concerned, it is shown that their mines in the United States produce nearly 1½ million tons annually. The Canadian Pacific Railway was forced to close down its own bituminous mines at Hosmer which entailed a great loss. It is a question, open to debate, whether a railway company—no matter how exceedingly well organised and managed it may be—is at the same time an efficient manager of an industrial concern of this type.

The consumption of coal by the railways is naturally greatly dependent upon the tonnage of freight which is carried, and upon the season at which it is carried. The winter of 1929-30 in which the Wheat Pool and other grain marketing agencies were unable or unwilling to sell their grain, serves as a striking example of the upsetting of all conditions in Canada. This affected not only the entire country, but with it brought many coal miners to the verge of starvation, by adversely affecting the output of bituminous coal mines.

2. The Railways as Carriers

One cannot say that our two great systems have shown in the past a benevolent attitude towards Canadian coal mines, even when it became a question of supplying their own requirements. There was never a co-operation of railway and mine officials—far from it, there was mainly disagreement and petty friction. The railways never considered the actual needs of the mines, and the greatest source of trouble at the mine is the irregular and unpunctual supply of empty cars, even for their own coal. This might be understood, if it happened only during crop movement or in case of accidents or in very severe weather. But it frequently occurs at other times, when the sidings on the prairie are filled with empties and nothing prevents their movement. The consequence is irregular operation and unnecessary interruption of work at the mines, with subsequent loss both to mines and labour. How often must miners, ready for their shift, go home again because the empties have not arrived!

The railways naturally have always the upper hand, especially when they are the customers of the mine—and the operators hesitate to lodge complaint in order not to antagonize the local railway officials. But even as carriers, railway officials assume the attitude of doing a kindness to the mines in transporting their output. Considering that transportation of coal from the mines to markets is a very remunerative item in their freight return, it is surprising to note the lack of reasonable co-operation or even more of common sense appreciation of valuable business opportunities.

In considering freight rates, extraordinary discoveries may be made. It is hard, perhaps impossible, to explain to the general public why freight rates for coal should be higher than for wheat. As a matter of fact, the rate for wheat is so adjusted that it can just move. But the rates for coal are arbitrary, absolutely unjustified, and so prohibitive that coal simply cannot move as far as it should.

To give one instance: the mileage from Fernie, B.C., to Winnipeg is approximately the same as that from Sydney to Montreal. But the rates are $5.10 and $3.80 respectively. No doubt, the railways will claim that, generally speaking, wheat and coal are moving in the same direction and that there is hardly any return freight. But what is right for wheat is certainly right for coal, and even more so for coal than for wheat, because the latter is a world's commodity, and the former is not—as far as Canada is concerned.

It is difficult to understand, from an economic standpoint, why railways should not feel inclined to develop an increased freight traffic for Canadian coal on their own lines, instead of permitting United States railways to reap an income from carrying coal used in Canada. It has been stated that bituminous coal importations into Manitoba via the Head of the Lakes are nearly two million tons, and that these could be fully supplied by the mines of Western Canada without opening a single new one. Nobody expects the railways to carry at a loss. This was amply proven by the public attitude in regard to the Alberta coal rate subsidy. But the appeal of the Fuel Board to the Board of Railway Commissioners, "that it is in the national interest to extend the market for Canadian coal and that coal is entitled to preferential treatment," remained unanswered.

From the standpoint of the railways it can be understood, that they only buy coal when they actually need it. But this practice is disastrous to the bituminous coal industry and accounts largely for the high price. The mines are actually compelled by the railways to produce in *three months* 88 *per cent. of their total annual output,* and this accounts for the fact of their overdevelopment by 80 per cent.

It is interesting to watch freight trains in the East, bringing United States coal to Canada. Such coal is being carried in open steel cars, specially constructed for the most economic transport, loading and unloading of coal.

Comparing these with old wooden Canadian open and box-cars—which are being used to-day for wheat, and to-morrow for coal or mixed freight, makes one feel that Canada certainly is a poor and backward country.

The loading of coal into box-cars requires—if it is not done by hand-shoveling—special machinery. This again increases the cost.

The Vice-President of the Canadian National Railway, Mr. Hungerford, expressed as far back as 1913 his desire to have such steel cars.

If such an authority demanded them, it can be assumed that they are of benefit to railways.

A short time ago Sir Henry Thornton declared: "the real basis of prosperity rests not upon temporary conditions, but upon the natural resources".

This remark could not possibly refer to one of the most important of Canada's natural resources, because if it did, we would to-day have a most thriving coal industry in Canada. The above statement by Sir Henry Thornton shows that the Canadian National Railway, which is entirely dependent upon national prosperity, is ready to assist, as is here promised by its distinguished chief, in solving much of the fuel situation as it confronts the Canadian public at present.

CHAPTER VI

INDUSTRIAL AND DOMESTIC MARKETS

LET us now travel from the Atlantic to the Pacific Ocean, let us look into the coal yards of the retailers, and into the furnaces of the industries, into the municipal gas plants and into the furnaces of the domestic consumer. What fuels do we find in all of them?

The iron law of supply and demand rules supreme.

There is an abundant supply of coal; the demand is regulated by the requirements of the industries, which do not increase, but rather tend to decline, and by the population, which is not increasing rapidly, and primarily by climatic conditions.

The dealers cannot be accused of lack of patriotism when selling foreign coal which they are able to purchase at a much lower rate than Canadian coal. And even if the public should demand

Canadian coal, and be willing to pay a higher price, they could not get it. However, patriotism ends where the pocket-book is concerned.

1. Industrial Market

Canadian industries consume eight million tons of coal and coke annually.

The industrial market of the Maritimes is not great and is being supplied mainly by local coal and coke.

The Montreal district is supplied by Nova Scotia and United States coal and coke.

Toronto and Hamilton use exclusively United States coal and coke.

Port Arthur and Fort William are a favourite market for United States coal.

Winnipeg is a centre of competition between United States against Alberta coal and Saskatchewan lignite—and coal consumption for power purposes is now materially reduced by the use of hydro-electric power.

The Prairies are supplied with Saskatchewan lignite and Alberta coal, also with natural gas, and petroleum coke.

The Vancouver market, formerly supplied by Mainland and Island coal, is now considerably reduced by oil, imported from the South.

The formerly thriving bunker trade is now nearly a thing of the past, owing to oil supplied from the South.

Thus, the industrial markets of the entire Dominion are restricted—as far as Canadian coal is concerned.

2. Domestic Market

For the heating of domestic furnaces and cooking ranges we find an abundant variety of fuels.

There are anthracites from the United States, from Great Britain and even Russia.

There are bituminous and sub-bituminous coals from Canada, from the United States and Great Britain.

There are briquettes from United States coal, from Souris Lignite, and from Alberta coal.

There is high temperature coke, imported from the United States, coke made in Canada from United States and Canadian coal, and gas-coke.

There are the low-grade lignites from Saskatchewan and Eastern Alberta.

There is hydro-electric energy.

There is gas.

There is fuel oil.

And lastly wood.

The Maritime Provinces are naturally using their own coal to a great extent; but imagine the resentment of unemployed Nova Scotia coal-miners in seeing ships passing their shores, westbound, loaded with foreign coal for the Montreal district!

Toronto burns two million tons annually, practically all United States coal or coke made from United States coal. The paltry 35-40,000 tons of Alberta coal now experimentally introduced, do not promise to conquer in the future this market.

Port Arthur and Fort William use largely United States coal.

Winnipeg consumes to-day 100,000 tons of United States anthracite and coke, together with Saskatchewan raw lignites and their briquettes, and Alberta lignites and sub-bituminous coal. And lastly, 100,000 tons of coal formerly used, are now replaced by fuel oil and electricity.

The further we travel west, the less United States coal is used. Further on, Saskatchewan lignites disappear on the market and Alberta domestic coals take their place, as far west as Medicine Hat and Calgary. In these areas natural gas and hydro-electric power have replaced their own coal supplies.

The Vancouver market is being gradually conquered by Southern oil.

This is an actual picture of conditions to-day. With an importation of about 20 million tons of coal and coke annually, what chance has Canadian coal—what relief can be afforded to the mines, miners and consumers, if such conditions are permitted to continue?

CHAPTER VII

IMPORTATIONS OF COAL

CANADA is using thirty-three million tons of coal annually.

Canada is the second largest coal importing country of the world—and yet she possesses 17 per cent. of the coal resources of the entire world.

It certainly is surprising that not less than 61 per cent. of the total population of Canada depends upon the use of foreign coal—and this exclusive of consumption by our railways. This foreign coal is being used practically only in Ontario and Quebec.

It seems ludicrous that over 100 million Canadian dollars should leave the Dominion annually, affecting adversely not only its currency, but also the country's trade balance—when every cent of this enormous sum might be used to great advantage in the country, safeguarding and advancing her industries, increasing the earnings of railways and paying a great number of workers, *who in turn would consume agricultural home products and become users of her industrial products.*

Most of these Canadian dollars go to the United States.

If there were a Chinese Wall dividing Canada and the United States, Nova Scotia would supply the Maritime Provinces, Quebec and Ontario, and export to the Atlantic markets of the United States. Alberta would supply the Prairie Provinces, British Columbia would be self-sustained and export coal to the Pacific markets of the United States.

This would change the present movement of coal from the South into an East to West and West to East movement, and were it possible, the fuel problem of Canada would be solved at once.

But there is no Chinese Wall and there should not be, although the United States try very hard to put one up for the protection of their own industries.

However, the United States are concerned to have several gates opening wide into Canada for all they desire to export and their greatest export item to Canada is fuel.

> “Geographically, the United States and Canada form a single unit; politically . . . they are divided .
>
> H. L. Keenleyside in
> *Canada and the United States.*

What kinds of fuel are we purchasing from the United States, and what is their annual average cost to Canada?

	Minimum
Anthracite	$30,000,000
Bituminous	27,000,000
Coke	5,500,000
Other coals	1,000,000
Petroleum	56,000,000
Gasolene	20,000,000
	$139,500,000

The total imports from the United States amount to somewhere around $900,000,000 annually, (*America Conquers Britain* by L. Denny), fuel constituting 15 per cent. of the total imports.

What a staggering total and what a percentage of all imports!

These purchases are to a certain extent justified by economic expediencies, partly attributable to geographical situation and partly to lower costs of production. It is an adage, that the natural coalfields of Ontario are situated in the United States. This political disadvantage must be overcome, or at least ameliorated.

Imports of bituminous coal from the United States to Canada were 14½ million tons in 1929, of which Ontario and the Head of the Lakes took 12½ million tons and Quebec practically the rest.

The bituminous coal mines of the United States are over-developed to the extent of several hundred million tons annually, in excess of domestic needs. This tremendous surplus affects naturally the market of their nearest neighbour. Besides this, owing to natural advantages, coal is not only produced cheaper in the United States than in Canada, but the haul is much shorter.

Consequently, United States coal sells in Ontario at prices which practically exclude competition with Canadian coal.

There is very little doubt that "dumping" takes place, and to a much greater extent than can actually be proven.

Mr. Howard Stutchbury, the Trade Commissioner of Alberta, discovered an extraordinary situation in Winnipeg. There, the United States coal distributors have their own sales-agents who admit frankly that they can afford to lose money on their Canadian business. They dispose of their "distress" coal and thus stabilize prices in their home market. By investigating the matter, Mr. Stutchbury finds that United States coal is sold in Winnipeg at a price which leaves the United States operators not more than 30 cents per ton to cover the cost and selling of coal.

This surely must be known to the Dominion Department of Customs. Has any attempt been made to enforce the dumping regulations, and if not, why not?

The Right Honourable W. L. Mackenzie King says in *Industry and Humanity*:

> "Where consumers extend their patronage to unscrupulous competitors, a handicap is immediately placed upon those who are preserving peace in industry and securing the welfare of working people."

A recent instance also proves dumping, when owing to the curtailments of the steel industry of the United States, the Canadian market was flooded with United States coke. But in considering the possible reduction of the importations of coal, we may look too much to its possible effect in the United States. We have nothing to fear there, because our exports of coal to the United States are less than half a million tons annually.

The coal mining industries of the United States are insignificant, or better, of little importance considering the total United States industries, from which Canada actively buys and continues to do so extensively. Besides this, as Canada depends so much on the importation of United States coal and oil, it is quite possible that any day something may happen to cut off these fuels. It happened once before with anthracite. It may happen again. What then? Our railways would stop, many industries would have to close down, the population would freeze to death, because such an additional, sudden demand upon Canadian coal cannot possibly be met at short notice. There is also the possibility, and not so remote, that the Standard Oil Company, with the aid of the Bergin process, may convert practically all fuel oil into gasolene. Then all houses, heated by oil, would have no heat, or would be compelled to purchase fuel oil from all corners of the world at exorbitant prices.

When we come to the anthracite quality of coal, we find that the United States importations have been considerably reduced during the past few years.

British anthracite, which is of better quality, replaces it. But anthracite was never supplied from Great Britain in sufficiently large quantities to fill the Canadian demand. Lately Russian anthracite has appeared on the scene and the importers inform the public that every boat bringing coal from Russia takes Canadian agricultural products to Mediterranean ports. In this altruistic consideration the public would only be interested—if the farmers or the Wheat Pool, would urge the purchase of Russian coal. Canadian wheat will find its market even without this support. It is well known, that Russia *must* export what she can, in order to receive foreign currencies, with which again to finance her foreign purchases. And thus we find that Russian coal, conveniently situated near Black Sea ports, traverses half the globe, to supply the Canadian market, which is only a few hundred miles away from its own home supply. Strange are the ways of world trade!

Anthracite is the highest form of luxury in fuel. It cannot and shall not be, that people should be prevented from enjoying this or any luxury. But why should there not be a luxury tax on it? The people who do not want to use anything else for reasons of their own, would hardly feel a tax of, say, $1.00 per ton. At present, anthracite is free of duty.

The Department of Finance counts, owing to the present duty of 50 cents per ton on bituminous coal, an annual income of $6,500,000, minus the drawbacks which amount to about $500,000. Any loss in duty incurred by using Canadian coal could be reduced by a tax on anthracite.

It seems impossible at present to oust all United States coal from its logical markets in Ontario and part of Western Quebec. But the Western market from Winnipeg or even Port Arthur on, should and must be reserved for Canadian coal.

CHAPTER VIII

EXPORTATIONS OF COAL

THE countries to which Canada is exporting an amount of coal worth mentioning are the United States and Newfoundland.

In 1929 the United States purchased 419,373 tons of coal, 32,143 tons of lignite and 52,721 tons of coke (which include 27,922 tons of petroleum coke). The Trade Commissioner of the United States in Ottawa reports different figures, and states as total value about $2½ million dollars.

In 1929 Newfoundland purchased 269,168 tons of coal, paying $1,426,706.

The principal Provinces exporting to the countries in the world are:

Nova Scotia..........with 350,000 tons of coal
Alberta................ with 53,000 tons of coal
British Columbia with 428,000 tons of coal

The prospect of increasing Canada's exports of coal is hardly brilliant.

CHAPTER IX

LABOUR CONDITIONS

THE cause of the unrest of labour, not only in the coal industry, but in all industry, is to be found in the following basic points:

(1) In the mistrust, the lack of confidence of labour, in represented capital;

(2) In the endeavour of owners and managers to cut down wages to a possible minimum, in order to show larger profits;

(3) In the constant war of labour against capital to obtain a "living wage";

(4) In the suspicion that representatives of labour find the only excuse for existence in unnecessary disputes and incitements to strike.

The Right Honourable W. L. Mackenzie King says in his work *Industry and Humanity*:

> "The existing attitude of capital and labour toward each other is too largely one of mistrust born of fear . . . An industrial system . . . must yield to a new order based upon mutual confidence, real justice, and constructive good-will."

Anybody who has spent his life with workmen, must have learnt the lesson that workmen are human beings with the same virtues, vices and habits, as any others. Once trust is established in the minds of workmen in the fairness and justice of those who direct their work, and in their willingness to treat them as human beings—everything has been gained. There is something illogical in capital treating labour in any other way than with full equality. We are living in what is regarded as one of the most democratic countries. If in electing the Government a workman's vote counts as equal to that of a millionaire's or capitalist's, then any forced subordination of labour by capital is illogical.

It has been the privilege of every employer to witness that in raising the working men to a higher social level than in the past, and treating them fairly and justly, they have established a friendly relation. Such confidence is only shattered by neglect or unfairness on the part of capital's representative. The natural question arises, how a lockout or strike could be possible under a parental friendly regime. This regime is naturally only possible locally—but when operators combine only for the avowed purpose of forcing wages down, and the workmen combine only for the purpose of enforcing higher wages, a constant war is on, and one peaceful local industry, one peaceful local union, has to suffer from the attitude of the multitude.

Again, having recourse to *Industry and Humanity*:

> "Human nature does not change when men become members of boards of directors, or sit in conclaves or cabinets. An autocratic man will be a tyrant, whether he be an Emperor, the manager of an industrial corporation, or the leader of a labour organization."

This is again a basic truth. A manager who is a martinet is doing more harm to industry than a dozen better men can rectify.

The specific trouble in the coal mining industry is the scarcity of competent managers. Canadians, in their close proximity to the United States, have adopted and are still adopting unwise customs from their powerful neighbours. Among them is the strange custom of making a mining engineer the manager of a coal mine. Coal mining is a highly specialised industry and a mining engineer should have his hands full in looking after the output and condition of the mine. He should be limited to this task. Co-ordinated or super-ordinated should be a business manager whose duty would be to look after the sales and costs-control, accounting and the welfare of the workmen.

The "living wage" is a very debatable point. This question of expressing in the various currencies of the world the needs of the working man and his family, and also the modest comforts of life, and relaxation and pleasures, has been and still is a great problem for national economists. We see the great difficulty at once, if we localise the question to Canada. The living wage in British Columbia is different from that in Alberta, and this again from Nova Scotia and Saskatchewan and New Brunswick. Labour is also a commodity, and will congregate in the country and place where demand pays higher wages.

The quota regulations of the United States are directed against the accumulation of labour, and especially of cheap labour. The quota is nothing else but another kind of tariff wall, protecting labour within the country against massed competition and keeping up high wages as long as the product of the work finds its outlet. But if, as at the present time, there is a stagnation in the purchasing will and power, an unemployment situation arises, which is the more serious, as the former standard of living cannot possibly be maintained without Union or Governmental assistance, unless a fall in prices for commodities takes place simultaneously.

A working man is not accustomed to save. Insurance against invalidity, workmen's compensation, old age pensions, point clearly the way towards collective insurance against forced unemployment, and if the payment of such legitimately earned "doles" from their own savings be left to the discretion of the workmen's chosen representatives, there will be the avoidance of incongruities, favouritism, simulation and unjustified refusal of work. The method of judging a defendant by his peers is certainly of great psychological value.

Notwithstanding the fact that labour in coal mines of Canada is well paid—overpaid in fact, if compared with the pay of mine labour in other countries—this does not mean that the worker in Canada lives more comfortably and can afford more luxuries. Quite the contrary.

The reason is the seasonal work, resulting in unemployment during intermittent and sometimes very long periods.

Many coal miners found their total earnings so unprofitable that they were forced into agriculture or other industries, or emigrated to the United States. The economy in the use of coal caused reduced output and necessitated the permanent laying-off of many good miners.

Among the present large number of unemployed there are many miners.

The years 1926, 1927 and 1928 show the following figures:

WAGE EARNERS EMPLOYED IN COAL MINES OF CANADA

Nova Scotia	Number	Average Days	Average Wage
1926	12100	247	4.69
1927	13317	245	4.81
1928	13333	243	5.83
New Brunswick			
1926	544	249	3.18
1927	558	285	3.58
1928	585	266	3.55
Saskatchewan			
1926	470	214	4.52
1927	509	214	4.42
1928	509	199	4.72
Alberta			
1926	8667	230	5.56
1927	8932	244	5.57
1928	9289	243	5.79

British Columbia			
1926................	5095	261	4.91
1927................	5038	278	4.94
1928................	5043	281	4.89
Canada			
1926................	26878	244	4.97
1927................	28357	251	5.03
1928................	28754	249	5.57

The best miners should be assured permanent employment.

An increased earning power by regular employment would be of great benefit to Canadian industries.

In the improvement of the coal condition, labour must contribute by efficient and more careful work.

The enthusiastic collaboration of labour is essential to success.

This collaboration should be recognised by appointing a representative of labour to the Dominion Fuel Commission.

CHAPTER X

PEAT

PEAT, compared to coal, is an inferior fuel, but in many countries an exceedingly valuable one.

What, for instance, would Ireland be without its peat supply? Germany, Poland, and Russia are using peat, in brick form, with great advantage.

Canada is reported to have many peat bogs, conveniently situated. The distinguished expert on the origin of coal, Professor Potonié, the author of *The Origin of Coal,* once stated his opinion to the author: "The Canadian peat bogs are half a million years too young."

The story of the deplorable efforts to establish a peat industry in Canada has already been told in the report of the "Peat Committee".

Many great scientists and engineers have devoted years of exhaustive studies and experiments to this problem; also large amounts of money, to be precise, half a million dollars, were ungrudgingly spent by the Dominion and Ontario Governments alone. But while it is reported that an economic method of manufacture has been developed, a peat industry has not yet been established, principally on account of the introduction of other fuels in the market, with which this low-grade fuel cannot compete.

For the present, peat as a Canadian source of fuel will have to be eliminated, until new methods for its economic use have been found.

CHAPTER XI

PETROLEUM

PETROLEUM is produced in Canada, but also imported in much larger quantities, in its crude form and as a refined product.

Crude petroleum is the basis for kerosene, fuel oil and gasolene, also petroleum coke, and similar products.

Crude Petroleum was used in Canada in 1929 to the extent of over 1072 million Imperial gallons, of which only 37 million came from Canadian wells.

Canadian gasolene production in 1929 was 437 million Imperial gallons.

About 2700 wells are in operation in Canada.

Petroleum and its products imported into Canada in 1929 cost not less than $76,000,000.

Three-quarters of all imported crude oil are being refined in Canada.

The production of petroleum in Canada in 1929 was approximately as follows:

New Brunswick ..	8,000	barrels
Ontario	121,000	barrels
Alberta	992,000	barrels

(One barrel is 35 Imperial gallons.)

At present, petroleum yields 50 per cent. gasolene, and the residue is a heavy oil, from which further by-products are extracted, leaving fuel oil.

4-5 barrels of fuel oil give the same heat as one ton of bituminous coal.

One of the petroleum products is petroleum coke, which finds a ready market in Canada.

The Imperial Oil Company (generally considered to be a subsidiary of the Standard Oil Company) is the largest producer, importer, refiner and distributor of petroleum products in Canada. This company has refineries in six Canadian cities.

The capital invested in Canadian oil refineries is about 55 million dollars.

It is not an exaggeration to state that

United States interests control this fuel in Canada.

Another possible Canadian supply of oil may come from the Athabasca tar sands which formed for many years the subject of scientific research at the University of Alberta and other scientific institutes. Formerly its only use was restricted to experiments relating to asphalt paving; but lately an Inter-departmental Committee of the Departments of Interior and Mines commenced extensive research for wider utilisation. The basic incentive was the economic extraction of the oil.

Two licenses for exploitation were granted to two private concerns. Part of their technical research work is being done in laboratories of the United States, part on the Clearwater Reserve of the Mines branch near McMurray. These plans include the complete refining of the oil gained, the production of gasoline and other derivatives, as well as paving materials. In the interest of

Canada it is hoped that these enterprises may be successful.

Oil shales exist in Nova Scotia and New Brunswick, but up to the present no economical methods have been discovered for their utilisation.

The attention of Research Institutes is particularly directed to this very important problem.

CHAPTER XII

NATURAL GAS

NATURAL gas has been found in New Brunswick, Ontario and Alberta.

The production in 1929 was as follows:

	M.cu.ft.	Value
New Brunswick	680,000	$ 333,000
Ontario,	8½ million	$5,000,000
Alberta	19 million	$4,500,000

These figures of Ontario and Alberta tell an instructive tale. Although the production in Alberta was twice as large as that of Ontario, the actual total value in dollars is lower. The explanation is the increased consumption due to the dense population of Ontario.

At present, an enormous waste of natural gas in the Turner Valley of Alberta is taking place. 300 million cubic feet per day, equivalent to 4 million tons of best bituminous coal per year, go into the air.

This has commanded the close attention of all who are interested in this field, or—as the Dominion Government—are entrusted with the development and conservation of National Resources.

At present the attempt is being made to pump into the ground of the exhausted subterraneous Bow River valley the superfluous gas from the Turner Valley for storage. If this proves a success, then a small part of this problem has been solved.

But the greater part of the natural gas still goes into the air. The scientists of the world should be induced to devote their attention to this Canadian problem, and an attractive reward should be offered for any practical solution.

The transmission of natural gas, as such, over land is only economical when a sufficient number of customers can be reached in a short distance.

An attempt to pipe natural gas to long distances seems a most injudicious project, since it cannot possibly carry any guaranty of permanency, nor of amortisation.

CHAPTER XIII

HYDRO-ELECTRIC POWER

THE tremendous development of hydro-electric power in recent years has resulted in an enormous saving of coal, which is estimated to be in excess of 34 million tons annually. It is evident that a further development will make Canada less dependent on importations of coal from foreign countries and fortunately hydro-electric power is available just in the most dependent markets, viz., Ontario and Quebec.

If one bears in mind that the developing power of 6 tons of coal is equivalent to one installed hydro-electric H.P., then one easily realises the great competition between these two forces.

At an 80 per cent. efficiency and ordinary 6 months flow, the following developed and available water powers exist in Canada:

Province of Quebec with	13,000,000 H.P.
Province of Ontario with	7,000,000 H.P.
British Columbia with	5,000,000 H.P.

Fortunately this development goes on, as it should, as an important effort to oust foreign fuels.

The equalisation of the economic use of power during the day peak and night slack will certainly sooner or later be solved by storage.

If the linking up of the great Hydro-Electric Systems should be carried into effect, it would be of phenomenal advantage to the Nation.

And where economic water power is not available, the use of coal for the economic production of electric energy may very materially stimulate domestic consumption of Canadian coal.

PART II

POSSIBLE SOLUTIONS OF THE FUEL PROBLEM

(A) TECHNICAL

CHAPTER XIV

CARBONISATION OF COAL

COAL is split up by heat into solid, liquid and gaseous parts.

This is done in coke ovens and gasworks.

Coke ovens are producing coke for smelters and industrial and domestic furnaces, and gas.

Gas works produce an abundance of lighting and heating gas, also gas-coke.

Other products are tar, sulphate of ammonia and by-products. Tar is the basis for aniline products, fuel oil and lubricants.

The coking is done at a temperature of 1200° Fahrenheit.

The higher the temperature, the higher the yield of gas.

One and a half tons of coal give one ton of coke.

Four tons of coal, converted into coke, are required to make one ton of steel products.

Consequently the great steel centres of the world are located over or near coal mines and coke ovens, or the latter in or near large cities where all the gas can be used, and by-products find a ready market.

To assist in the establishment of coke ovens in Canada, the Dominion Government is allowing a drawback of 99 per cent. for coal used in them, which means a reimbursement of 75 cents per ton of coke made from foreign coal. The result is, that the coke plant in Montreal still prefers to use United States coal in preference to Nova Scotia coal, in spite of the advantages offered under the Domestic Fuel Act.

Why gas plants—which practically produce the same constituents as coke-oven plants—should not receive the same drawback, is a logical question.

If the coal is heated to only 600° Fahrenheit, we produce the same constituents only in different form and quantities. This is called "low temperature carbonisation". The yield of gas is much less. It can be regulated in such a manner that just sufficient gas is produced to heat and drive the plant itself.

The coke is quite different from the coke obtained in high temperature carbonisation. It is easier to ignite, can burn more rapidly if desired, and makes, therefore, an ideal fuel—smokeless, and fully equal to anthracite.

The coke will store indefinitely and is valuable enough to be transported over long distances. The loss in weight of coal, converted into such high-grade coke, is more than offset by the production of this high-grade fuel, and the value obtained from the other by-products. If economical success is proven by tests, a model plant should be installed at Ottawa which might sell its gas to the Ottawa Gas Company, as well as its other products.

This low temperature carbonisation is most advantageous for Canada, as generally there is no need for an abundance of gas; on the other hand, it produces a splendid coke which should conquer the market easily, and oust foreign anthracite.

This coke should be briquetted, if desired.

The introduction of low-temperature carbonisation plants seems of high value in the fuel situation of Canada.

There are still nearly 1,000 so-called Beehive-Coke Ovens in existence at the Crow's Nest Pass district, which produce only coke and let the valuable by-products go into the air.

But since by-product coke ovens came into use, they only are being constructed, and we find them at Sydney, Halifax, Montreal, Hamilton, Sault Ste. Marie, Winnipeg, and Anyox.

As previously explained, they can only be of economic advantage, where the large supply of gas can be used for smelting or other industrial purposes, or for domestic purposes, and further, where the resulting coke can be disposed of, in competition with other fuels.

The installation of more "high-temperature" coke oven plants is highly recommended, wherever the economical conditions justify their installation.

Of low temperature carbonisation plants, only one installation is reported in course of construction, at the Head of the Lakes.

Low temperature carbonisation seems ideal for Canadian conditions and should be studied most energetically and employed wherever feasible.

This process is able to use inferior, low-priced coal and yet produce high-class results.

CHAPTER XV

GAS PLANTS

IT is noteworthy that most of these are not modern and consequently supply gas at high prices.

Gas coke is inferior to coke produced in coke ovens.

Twenty-five Canadian cities possess gas plants.

It would be of great benefit to the cities and the public utilities themselves, to modernise their gas plants or install low temperature carbonisation plants.

There is also a new process in view, namely to produce gas by utilising low grade fuels, leaving no coke or other by-products.

If the production of gas results in cheaper prices to the consumer, the installation of gas furnaces will increase by leaps and bounds. There are still several cities without any gas. An instance is Hull, where transmission of gas from the Ottawa works should be able to supply Hull with this very convenient fuel.

Gas is certainly destined to preference over fuel oil, and its greater use is highly recommended.

The gas companies should bear in mind the seasonal demand for their products. If burners and boiler sets are to be newly installed, they should be adapted for interchanging firing with graded and pulverised coal, or oil.

CHAPTER XVI

CENTRAL AND DISTRICT HEATING

THE possibility of economy in Central and District Heating has been practically demonstrated in various countries, for instance in the United States, where 300 systems are in use. But we also find some in Canada.

Central heating plants have been constructed for the Parliament Buildings in Ottawa, and in the Universities of Toronto, Montreal, Edmonton, and Kingston. We find district heating to a great extent in Winnipeg. These systems give to the consumer cleanliness, comfort, health, convenience, safety, saving of the cost of furnaces, and economy, since they permit the use of cheaper kinds of coal in the central plants. Especially in Ontario and Quebec, these systems should be installed wherever advisable.

In this chapter, the attention of the public, and especially of the architects, may once more be called to the more scientific building of houses to ensure the saving of fuel by insulation. Not only will the owners benefit by saving of fuel, but less foreign coals will be used, and the Canadian coal reserves will be protected. These two main reasons ought to be sufficient on national grounds to ensure attention to the question.

CHAPTER XVII

PULVERISED COAL

IT was probably the use of fuel oil, in its spray igniting and burning, which prompted the first experiments for using pulverised coal.

It is now greatly used for burning cement in rotary kilns; in metallurgical furnaces it is already being substituted for ordinary coal, or gas, or oil, and lately in stationary, locomotive and marine boilers.

There are many Canadian coals which are suitable.

The most successful field has been the replacement of externally fired furnaces.

Its great competitors are gas, oil, and tar, and they are still preferred, if costs are equal.

At present there is hardly great inclination to use pulverised coal on the railways and in other boilers, and yet the use of slack coal—which is one disadvantage of our coals—would be a great help to our coal mines.

Consequently, a further improvement in the use of pulverised coal must be hoped for.

POSSIBLE SOLUTIONS OF THE FUEL PROBLEM

(B) ORGANISATION

CHAPTER XVIII

LEGISLATION

1. Appoint the Dominion Fuel Commission.
2. Cancel unworked leases for mining coal, after expiration, unless needed for the life of a mine in operation.
3. Grant permission for opening of a new mine only if its economical advantage to the Nation is proven.
4. Close down by expropriation all uneconomical mines. They are only endangering the welfare of others which are of actual use and need to the country.
5. Determine proper duties on coal and reasonable drawbacks.
6. Eliminate duties on coal mining tools, machinery, oil-drills and apparatus whenever not manufactured in Canada; encourage their manufacture in Canada.
7. Eliminate the Provincial taxes on coal mined.

8. Finance by Government loans or purchase or guarantee of bonds, enterprises in connection with fuel.
9. Advance by loan or guarantee, the amounts of payroll to mines for the production of coal to be stored.

CHAPTER XIX

DOMINION FUEL COMMISSION

THIS Commission should have powers similar to those of the Railway Commission.

Its appointment should neither be political nor subject to political influence.

It should be composed of five commissioners:

- One to be appointed by Order-in-Council.
- Three to be appointed by Order-in-Council, until Coal Syndicates are formed and depute their representatives.
- One to be appointed by Union Labour.

The Commission should have attached as a permanent body, the present Dominion Fuel Board in a scientific, technical, and economic advisory capacity, to be increased by appointments of other scientists, economists, business or financial experts, as required.

The Commission to have authority to

1. Instigate and supervise the formation of Coal Syndicates.
2. Supervise the production, distribution, sale, delivery and consumption of fuel, and make regulations in connection therewith.
3. Regulate and control the prices of coal, coke, gas, and oil products.
4. Recommend duties and drawbacks in connection with fuel, to the Minister of Finance.
5. Recommend to the Railway Commission regulations for freight rates on fuel.
6. Supervise and standardise the sizing of coals and the issuance of certificates of grading by the syndicates, including the percentage of ash.
7. Study and recommend to the Railways improvements in regard to their fuel consumption.
8. Supervise wage and labour conditions and make regulations in cooperation with the Provincial Governments.
9. Recommend to the public the most economical fuels to be used in their locality, and instruct the public how to use them. Encourage the economical use of fuel in industries and homes by an educational campaign.
10. Encourage the study by the various Research Institutes respectively, and by foreign In-

stitutes and Scientists, of the following problems:

- (a) The economic use of fuel by new methods.
- (b) Economic possibility of installing electric plants on coal mines, for transmission overland.
- (c) Transmission of natural and coal-gas overland.
- (d) Economic installation and location of high and low temperature coking plants.
- (e) Modernising municipal gas-plants.
- (f) Installation and location of Central Heating Plants.
- (g) The greater use of transportation by water for fuel.
- (h) The study of waste in all branches of fuel production, distribution, and consumption.

11. Recommend the financing in connection with fuels and their conversion and conservation, further in regard to freight, distribution and storage.
12. Encourage the manufacture of tar products in Canada.

CHAPTER XX

AMALGAMATION OF MINES

"Mergers have been another important factor in American industrial progress . . . this process accounted for the disappearance of about 5000 mining and manufacturing concerns in the period 1919-1927."

L. Denny,
America Conquers Britain

THE most drastic and efficient remedy to save the coal situation is to bury the hatchet of competition in an apparently decreasing market, and combine. The purpose of the operation is not by any means merely the self-protection of this very important Canadian industry, but the national policy of trying to save the Canadian coal market for Canadian coal.

The more progressive coal companies demand the best engineering talents available, promote advanced safety and producing methods, introduce modern machinery and endeavour to improve social conditions of the workers. Less progressive mines are more concerned with the matter of immediate profits, neglecting any progress. The financial condition of some struggling mine forces naturally a very uneconomic policy.

The coal industry, as such, bears a relatively higher overhead than any other Canadian industry.

The purpose of amalgamation is the same as in other industries, only to a more intense degree, viz., to reduce the overhead, and to place the individual interests in one strong hand. There is no need to elaborate on the actual advantages derived from such amalgamations. The power which such an amalgamation creates, has often resulted in a monopolistic attitude towards the public, and laws had to be devised to counteract this.

But in the case of Canadian mines, provision will be made for a control and regulation of prices to the consumer. However, as it is in the self-interest of the producers to keep their prices low in order to wrest the market from their foreign competitors, this danger is not as great as might be expected a priori.

The strange thing is that all attempts in the West, to combine certain mines in the same district, failed on account of the attitude of a few operators. Everybody seems to want to sell his mine for cash, and for ridiculously enormous amounts. But if the mines, already agreeing on amalgamation, would amalgamate, it would not matter if one or two mines would not join at once. There are ways and means to induce such co-operation of all.

In Nova Scotia there is already a considerable amalgamation in the coal interests of Dominion Steel and Coal Company.

In Alberta, the bituminous mines north of the main line of the Canadian Pacific Railway should co-operate, and those in and near the Crowsnest.

In Vancouver Island an amalgamation of several mines has lately taken place.

Of domestic mines, those west of Edmonton are predestined to amalgamation, and ideal for this purpose is the Saunders coalfield, also the Drumheller Valley.

Probably the reason for failure in the past was the inability of the moving spirit to prove by a large bank account his serious intention of financing an amalgamation.

The saving to be effected would be expressed by the reduction in overhead, in technical and administrative costs as well as in the sale of coal, if necessary, directly to the markets. Not to speak of the advantages in purchasing supplies, and in allotting orders to the mine which can produce at best advantage, and closing down temporarily or permanently uneconomical mines which would only hinder the success of the amalgamation.

Such amalgamations will result in the establishment of efficient organisations with secure finances. They can accomplish what a number of separate mines cannot do, namely, reduce mining costs, eliminate the waste of irregular mining and convert this into uniform mining, transport and store coal during the slack season and extend credits to customers where necessary.

From an economic view, it stands to reason that wherever amalgamations can be brought about on a proper and justified valuation, they will certainly become profitable to the combining interests.

This proposed amalgamation of hitherto competing interests is one phase of the question, how the mines themselves must help in solving the fuel problem.

There is also the technical aspect. Generally speaking, very little attention is being paid to the preparation and cleaning of the coal. The ash content should be reduced to a possible minimum by picking and washing with water or air. The ash forms a dead weight which only costs unnecessary money in transporting to the market and consumer, as it produces no heat, and means unnecessary work for the consumer. The ash content of European coal is generally much lower than that of Canadian coal. And notwithstanding this natural advantage, the cleaning of coal in Europe has been carried in practice to a very much larger extent. As the washing by water produces inconveniences in our rigorous climate, the recent invention of dry cleaning, namely, by air, has made great strides in a very short time. After three years, already one million tons were cleaned by air, and in 1929 not less than 7 million tons. Three Canadian coal mines have installed this system, which is proving very successful, as it reduces the ash-content to half.

The preparation of coal, the sizing, is also of great importance and advantage to the consuming public and industry. At present the conservatism of the population of the West still prefers large lumps of coal. The only reason for this strange anomaly must be the appearance of the coal to the uninitiated, because these unwieldy sizes only mean work to the consumer in breaking them into convenient sizes. These large blocks are even paid for at a higher rate than coal of convenient size. A problem, still to be solved, is the use of the fine slack-coal. Owing to natural conditions, it often contains the largest proportion of ash, and should therefore be used, if possible, at or near the mines in order to avoid the high costs of transportation. It is being used for heating the mining plant and producing power; but in future it should, if possible, be carbonised, if a way can be found to reduce the high ash.

The sizing of coal in standard sizes should not be done at the mines, but at distribution points, except where full carloads go direct to consumers. Four standard sizes are all that is necessary for consumers to choose from.

The Minister of Mines for British Columbia reports in 1928:

"The amalgamation of the principal

mines in the Vancouver Island field is an important factor, improving the coal mining industry which should result in its steady growth in the future.''

CHAPTER XXI

COAL SYNDICATES

WHAT is a Coal Syndicate or Cartel? It is a system of co-operative marketing.

This combining of interests has taken different forms in various countries.

The simple threat by the British Government in its Mining Industries Act of 1926 brought about the voluntary amalgamation of several large mines.

In Scotland a marketing scheme for export of anthracite proved a success and salvation from over-production.

The Midland coalfields followed with a quota system.

South Wales is at present negotiating on the same lines.

In the United States the "Tidewater Coal Exchange" was a success and was abandoned only when the reason for its existence disappeared.

In Germany, such co-operative organisations are called "Cartels". The famous coalfield of the Ruhr was at one time absolutely doomed economically. As a remedy, every producer became a shareholder in a coal selling syndicate, which allotted a certain percentage of the total output to each mine. All shareholders benefitted in consequence in the success of the syndicate, and this system has been in use for eleven years. In a most ingenious way it was made possible for a mine owner to sell his quota of output to another mine, and shut down his own mine which was producing uneconomically. This proved a panacea and seems ideal for Canadian conditions. From the outset, the syndicate controlled the distribution, ousted the unnecessary middlemen and sold direct to the large consumers. The whole scheme worked so well that it became the model for all other German Cartels which are also proving to be very successful.

Considering that these German Cartels had only to fight competition within their own country, and comparing this with our domestic competition plus foreign competition—which does not prevail at all in Germany—it strengthens the necessity of forming cartels or similar organisations in Canada.

How would such a system work in Canada? We would have a:—

Nova Scotia Coal Syndicate (an amalgamation exists practically already in the Dominion Steel and Coal Company, but should be extended further to create a Syndicate).

Alberta and Southeastern British Columbia Coal Syndicate (subdivided into bituminous, sub-bituminous and lignite Syndicates).

Mainland and Island British Columbia Coal Syndicate. (subdivided in two Syndicates).

The associating mines would form a selling syndicate and allot to each mine, with a guarantee, a certain output.

The object of these Syndicates should be:

1. To inspect, grade and classify coal

and issue certificates as to origin, quality, weight and ash.

2. To promote the interests of producers and consumers.
3. To arrange for economic shipment, storage and distribution.
4. To sell coal at a price which includes the cost of wholesale selling. The selling organisation shall not be conducted for profit.
5. To advance to the mines, if necessary and according to the output under the quota, money for payroll and freight purposes and collect moneys.
6. To distribute moneys received.
7. To arrange, if possible, contracts with wholesalers and retailers.

CONCLUSION

THE main features of the fuel situation may be summarised as follows: Canada has enormous resources of coal sufficient for many generations to come; and her fuel is available in certain regions and immediately at our disposal without further investment.

Canada has an important railway net, rather more extensive than economic, certainly beyond its actual present and possible near future requirements.

Consequently, the fundamental features for an independent supply are existing. The main handicap still is the long distance from the mines to the markets, resulting in an intense competition with foreign supplies. Apparently the industry has been unable or has made no attempt to overcome by its own efforts the present serious hindrance.

That is the principal reason for the present precarious condition of the whole fuel situation.

If the Fuel Problem be considered from a national standpoint, it has quite a different aspect. National does not only mean the abandonment of local and provincial interests in favour of a wider, embracing atmosphere of the Dominion, but it means the complete subjection of all minor interests to the interests of the entire nation. And Canada avowedly is a Nation. There is no alternative. The question must be dealt with from a national standpoint.

Would it not obviously be more profitable to the entire nation thoroughly to organise its own coal industry, to found new industries upon it, and thus derive increased potential wealth, providing increased haulage for Canadian railways, adding to the number of her mining population, which we have shown will in return stimulate the consumption of agricultural and industrial products—or continue to export the gigantic amount of about $100,000,000 annually, sacrifice these potential possibilities by continuing a policy or lack of policy, responsible for the deplorable conditions as they exist at present?

There can only be one answer from the Atlantic to the Pacific to this question.

If this tremendous amount could be gained by Canada's own coal industry, it would support thousands of miners and their families, meaning many more thousands of population. What a wonderful logical and biological immigration policy!

This unfortunately is but a dream. Canada must be content to realise even a part of it. What then are the difficulties and how can they be overcome?

There must first be brought about a unification of minds, bent on National Welfare, determined to waive petty personal, local and provincial interests. All must be of one mind, no matter how autocratic it may sound:

No matter what fuel is to be used—coal or electricity, or oil or gas—it *should, if possible, be of Canadian origin, or manufacture.*

This should be the dictum of the Nation's most sacred egotism, its loftiest view and integral duty for generations to come.

It will not be easy to bring together the mine-operators in their local fields, then embrace further regions, then to get the co-operation of the railways, then induce an energetic attitude of the Governments and lastly arouse a high interest in the consumer—who will benefit financially from the start; but the consumer is the entire population.

The East and the West have to unite in the endeavour to convince Ontario that its interest is ultimately bound up with their interest. Once the public sentiment is aroused, the Governments will have to act or they would not fulfil their duties of statesmanship. Drastic measures will have to be applied and some individuals and interests will probably object and place obstacles in the way—as they do in every economic change—but the final success will be of inestimable profit to the Nation as such. Several solutions are possible.

If they are not applied and at once, Canada's coal industry, which groans under unbearable conditions, will be exposed to further financial losses of capital and increased non-employment. The industry must progress or go under. Stand-still is retrogression.

The time is past for the coal industry of the East and the West to lobby or beg assistance and this to be granted as usual, for political expediency. It must be ungrudgingly given for national reasons.

Capital and labour, making up this most important industry, based on one of the most valuable of natural resources of Canada, sustaining the life of her people and giving power for her industries, can and should demand as their legitimate right every support and provision for its welfare.

There should be no half-hearted measures. There must be a determined

"Canadian Fuel Development Plan".

The Dominion Government, together with the Provincial Governments, should consider how the problem can be ameliorated immediately and be solved as far as possible in the future. There will be need of concerted legislation and of financial assistance. The first will hardly meet opposition, and should the second be criticised, then it might be well to remember, that, for instance, the proposed Union Station in Montreal will cost the taxpayer the amount of $50,000,000, and this expenditure of money is certainly not so essential to the Nation—as the financing of the Fuel Development Plan.

The Right Honourable W. L. MacKenzie King, says in *Industry and Humanity*:

"Wise governmental policy in the encouragement and direction of Industry, and in the cultivation of domestic and foreign markets, improved methods of distribution . . . . . . are, one and all, incentives to increased production, and therefore far-reaching in their possible effects upon the successful adjustment of industrial relations. . . . .

Policies of government with respect to industry, to trade and commerce, to transportation and communication . . are scarcely less important as factors in determining industrial conditions than the ground work which Nature itself provides."

And the coal industry of Canada and the Nation does not demand anything more—and nothing less.

It seems a foregone conclusion to hope that Canada could be absolutely independent of imports of fuel. But ways and means have to be found to make Canada less dependent—and to provide for the possibility that Canada might be shut off, and this suddenly, from a foreign supply. "Si vis pacem, para bellum." The first step should be by legislation and private enterprise, to regulate and increase the production of coal and its derivatives from our own natural resources. If this can be done, and it must be done, we would not only see our coal industry in a more flourishing state, but also a reduction of the price which the consumer has to pay. In fact, this latter intention, if carried out, will produce the former. The coal mining industry must do its utmost to help itself. The first steps within the industry should be amalgamations and the formation of coal syndicates.

They will immediately bring about a reduction in mining costs and savings in distribution. The amalgamations will result in an increased profit to the industry, the coal syndicates in a reduced price to the consumer. This again would permit an extension of the market, and it should be assisted, and energetically, by greater use of water-transportation, as well as a reduction of freight rates.

The Fuel Commission should be appointed immediately and should function as the paternal body in charge of the National Interests.

The present Fuel Board would act as

the permanent technical and economical adviser to the Fuel Commission. Judging from its activities in the past, which were prompted by the organising talent of Dr. Chas. Camsell, who instilled into the members the enthusiasm for their work, there need be no misgivings in counting on their efficient services in the future. They, being Civil Servants, employed by the various Departments, took most willingly the additional work on their shoulders—with never any monetary reward for their continuous additional duties.

Amongst the problems which the Fuel Board would have to face in an economical, practical way, adapting it to local conditions, is the very important question of derivatives from coal. They are destined to supplant foreign raw coals in the "acute fuel area" of Ontario, especially anthracite. By extracting from United States bituminous coal the valuable constituents, the installation of coking plants means another important Canadian industry, which will not only supply gas to districts not yet served with this convenient fuel, but must also result in cheaper gas to the consumer. The coke will gradually oust anthracite which, if demanded, must be imported, because Canada has none. The question of establishing low temperature coke ovens in the East and in the West must also be studied. It will then be found, that the installation of more high temperature coke ovens, and of low temperature coke ovens, which latter do not yet exist in Canada, will be of great economic advantage.

Considering now the geography of Canada from a fuel-distribution standpoint, the first aim of a National Fuel Development should be to leave at present only one stretch of the whole Dominion still to be supplied by U. S. bituminous coals, and that is the region between Ottawa and Fort William. Whatever coal is used from the Atlantic to Ottawa, and from Fort William to Vancouver, should come from Canadian sources.

But the coal industry, aided by the Governments and the Fuel Commission, cannot overcome all hindrances. The great railways, as consumers and carriers, have to join, and with enthusiasm, and *esprit de corps.*

In the first instance, it can be assumed that both systems would buy Canadian coal in preference to foreign coals—if prices and conditions are equal, or nearly equal.

The railways, instead of insisting on a peak purchase load during three months, could and should buy coal more uniformly all the year around and store it at proper distribution points. This in itself would result in a lower price of coal for their own use, and would be of great assistance to the mining industry.

They could further assist by the elimination of demurrage charges to the mines, whenever their empties are not needed elsewhere. They should supply empties punctually, whenever needed.

They should not press the mines for immediate payment of freight, when shipping industrial and domestic coal during the slack season to distribution points—i.e., not insist on collecting freight charges until the coal is actually paid for. The railways at any rate have the coal as collateral.

The Canadian Pacific Railway has naturally to satisfy its shareholders as to profits. But this railway has never failed yet to show its patriotism in the past, since its inception.

The Canadian National Railway offers, however, a different aspect. It is the property of the nation, maintained by the nation, being kept alive by the taxpayers of the Dominion. The welfare of the Canadian coal industry is of national importance, just as important to the nation as the railway itself.

The attempt to ameliorate the fuel situation of Canada will demand considerable new financing. While, of course, this will have to be borne eventually by the industry itself, benefitting from an extended demand for its coal, the Governments will have to assist in a large way, at the commencement. Which are the schemes which need financing?

The amalgamations and coal syndicates must be financed by the coal mines themselves, without outside aid, or in other words they must stand on their own feet. The distribution system, as far as the moratorium on freight charges is concerned, will be aided by the railways—or by the Canadian banks, which should consider coal a commodity and advance funds on this collateral as they do for wheat. The selling itself will not need to be assisted by the public purse.

But the modernising of coalyards may demand capital beyond the means of amalgamations and coal syndicates. It is not the purpose of the development plan to oust wholesalers and retailers. On the contrary, wherever they are willing to place their services at the disposal of the coal syndicates, allowing them to control their costs and a legitimate profit, they might be retained. But their handling of coal, which must be modernised and economical and efficient—should be controlled by the syndicates and by the Fuel Commission. Unless these agents find the necessary capital themselves, Municipalities, or the Provinces, or the Dominion—or all jointly—should facilitate the raising of capital.

The more regular mining of the future will demand advances for the payroll, to be paid when the output is sold. This means discounting of bills of lading by the Banks.

Then comes the installation of high and low temperature coke ovens and the modernising or replacement of gas plants by low temperature carbonisation plants. This should be aided—if the gas companies or new industries cannot raise the capital—by the Governments. The same would apply to central heating plants. In no case should a subsidy be asked for. If any industry cannot live without subsidy, it is not economically worth being created.

What funds are available for such raising of capital and for credits?

We have seen that the Consolidated Funds of the Dominion receive an amount of about $6,000,000 annually in duties from imported foreign coal. This amount, if earmarked for the benefit of the coal mining industry—which suffers on account of these imports—would mean the interest on a capital of not less than $100,000,000.

This reserve of $6,000,000 annually may never be drawn upon entirely or in part. But it would be the guarantee of interest, by the Dominion, as to the capital which the industry must raise. Therefore, all that is being asked, is the guarantee of securities to be issued. The issue of such securities must be subject to the most thorough and scrupulous investigation in regard to necessity and soundness by all the interests concerned, under the supervision of the Fuel Commission, with the ultimate sanction of Parliament. Considering the great importance of the problem, which is of National interest, the demand made is logical and most reasonable. Nobody could possibly object—in the contrary, everybody should agree to it as a public necessity. No more deserving cause has ever asked for national support.

There seems no need to elaborate on the desirability of the removal of the tax on Canadian mined coal. This would mean a loss of income to the Province of Alberta for instance of approximately $350,000 annually. Out of this amount, $75,000 is for coal consumed within the Province. Considered, therefore, from a purely Provincial standpoint, the Province would actually lose a levy of $275,000 which—as the entire tax—is being passed on to the consumer outside of Alberta. But the reduction of 5 cents per ton on the price to the consumer, together with the other savings effected by distribution, will extend the market for Alberta coal. And as this has been the most energetic endeavour of the Alberta Government for so many years, the Province cannot possibly object to this apparent monetary loss which will be more than offset by a thriving industry.

There should be great endeavour to induce the Railways, the Industry and the public to purchase and receive coal in summer. It cannot be expected that these consumers would willingly purchase and pay for what they need four to six months later. Consequently, an inducement has to be offered, and this should be not only a reduction in price, month per month, but also in the method of payment. The instalment system has enabled the public to buy pianos, and books, and radios and motor cars by weekly or monthly payments. Why should this not be done with regard to coal?

The purchase of fuels in Canada is now done from hand to mouth. It should be altered by offering economic advantages to the consumer for purchasing and taking a supply in summer, or early in the fall. Various utilities offer a considerable discount for cash payment if made until a certain date. This is being used largely. Why could that not be done in regard to fuel purchasing?

It has been stated by dealers that some of their accounts have been extremely difficult to collect, especially during the last winter. And thus we find that the coal actually burned last winter has not yet, in summer, been paid for. The public utilities enforce payment or shut off their supply. The coal-dealer cannot do that, because he has no monopoly and his customer will unfortunately turn to a more lenient dealer. This again accounts to a certain extent for a higher price of coal, not only to the tardy customer, but also to the punctual payer.

There seems no doubt that electric energy must and will be developed further and further either from water-power or from coal. The electric power schemes have never yet had any difficulties in being carried into effect, and financed.

The search for petroleum and natural gas is still being continued, and should be encouraged.

The solution of the fuel problem should occupy the thoughts of the public, and in particular, of those who now—by the vote of the Nation—are entrusted with the safeguarding and furtherance of the welfare of the Nation.

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APPENDIX

(1)—Historical Table of Coal Production in Canada

Year	Short tons	Value	Average per ton	Year	Short tons	Value	Average per ton
		$	$			$	$
1785–1866......	2,863,826	4,905,462	1.71	1898...........	4,173,108	8,224,288	1.97
1867...........	631,320	1,056,725	1.67	1899...........	4,925,051	10,283,497	2.09
1868...........	623,392	1,073,061	1.72	1900...........	5,777,319	13,742,178	2.38
1869...........	687,825	1,155,282	1.68	1901...........	6,486,325	12,699,243	1.96
1870...........	752,635	1,243,139	1.65	1902...........	7,466,681	15,210,877	2.04
1871...........	3,033,152	5,073,331	1.67	1903...........	7,960,364	15,942,833	2.00
1872...........				1904...........	8,254,595	16,592,231	2.01
1873...........				1905...........	8,667,948	17,520,263	2.02
1874...........	1,063,742	1,763,423	1.66	1906...........	9,762,601	19,732,019	2.02
1875...........	1,039,974	1,747,016	1.68	1907...........	10,511,426	24,381,842	2.32
1876...........	994,762	1,729,546	1.74	1908...........	10,886,311	25,194,573	2.31
1877...........	1,036,670	1,794,415	1.73	1909...........	10,501,475	24,781,236	2.36
1878...........	1,089,744	1,941,285	1.78	1910...........	12,909,152	30,909,779	2.39
1879...........	1,126,497	2,050,639	1.82	1911...........	11,323,388	26,467,646	2.34
1880...........	1,482,714	2,657,194	1.79	1912...........	14,512,829	36,019,044	2.48
1881...........	1,537,106	2,688,821	1.75	1913...........	15,012,178	37,334,940	2.49
1882...........	1,848,148	3,248,446	1.76	1914...........	13,637,529	33,471,801	2.45
1883...........	1,818,684	3,109,635	1.71	1915...........	13,267,023	32,111,182	2.42
1884...........	1,984,959	3,593,831	1.81	1916...........	14,483,395	38,817,481	2.68
1885...........	1,920,977	3,417,807	1.78	1917...........	14,046,759	43,199,831	3.08
1886...........	2,116,653	3,739,840	1.77	1918...........	14,977,926	55,192,896	3.68
1887...........	2,429,330	4,388,206	1.81	1919*..........	13,919,096	55,622,670	3.99
1888...........	2,602,552	4,674,140	1.80	1920*..........	16,946,764	82,496,538	4.86
1889...........	2,658,303	4,894,287	1.84	1921*..........	15,057,493	72,451,656	4.81
1890...........	3,084,682	5,676,247	1.84	1922*..........	15,157,431	65,518,497	4.32
1891...........	3,577,749	7,019,425	1.96	1923*..........	16,990,571	72,058,986	4.24
1892...........	3,287,745	6,363,757	1.94	1924*..........	13,638,197	53,593,988	3.93
1893...........	3,783,499	7,359,080	1.95	1925*..........	13,134,968	49,261,951	3.75
1894...........	3,847,070	7,429,468	1.93	1926*..........	16,478,131	59,875,094	3.63
1895...........	3,478,344	6,739,153	1.94	1927*..........	17,226,861	61,867,463	3.55
1896...........	3,745,716	7,226,462	1.93	1928*..........	17,564,293	63,757,833	3.66
1897...........	3,786,107	7,303,597	1.93	1929...........	17,496,557	63,065,170	
				Total.......	457,287,622	1,354,462,246	....

*For the years 1919–1928 the tonnage shown is the total output from all mines: for previous years the tonnage shown includes only sales, colliery consumption, and coal used by the operators.

(2)—Production of Coal in Canada, by Grades, Past Ten Years

Calendar year	Anthracite		Bit		Sub-Bituminous*		Lignite		Total	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value	**Short tons**	**Value**
		$		$		$		$		**$**
1919....	85,579	....	10,892,046	....	......	....	2,941,471	....	**13,919,006**	**55,622,670**
1920....	127,513	....	13,122,924	....	......	....	3,696,327	....	**16,946,764**	**82,496,538**
1921....	96,964	330,699	11,680,477	58,848,444	......	....	3,280,052	13,272,513	**15,057,493**	**72,451,656**
1922....	40,417	122,538	11,630,488	53,348,507	......	....	3,486,526	12,047,452	**15,157,431**	**65,518,497**
1923....	107	322	12,941,877	58,478,670	466,492	1,399,424	3,582,095	12,180,570	**16,990,571**	**72,058,986**
1924....	....	....	9,483,732	40,662,894	590,168	1,761,086	3,564,297	11,170,008	**13,638,197**	**53,593,988**
1925....	....	....	8,939,607	36,793,501	570,654	1,731,267	3,624,707	10,737,183	**13,134,968**	**49,261,951**
1926....	....	....	12,393,079	48,153,572	489,736	1,458,116	3,595,316	10,263,406	**16,478,131**	**59,875,094**
1927....	....	....	13,006,996	49,385,818	596,155	1,784,973	3,823,710	10,696,672	**17,426,861**	**61,867,463**
1928....	....	....	12,971,744	50,584,108	740,496	2,076,212	3,852,053	11,097,513	**17,564,293**	**63,757,833**
1929....	....	....	12,859,822	49,995,261	668,702	1,908,954	3,968,033	11,160,955	**17,496,557**	**63,065,170**

*Not separately reported prior to 1923.

(3)—Output and Value of Coal in Canada by Kinds and by Provinces, 1928 and 1929
(short tons)

Province	1928		1929	
	Quantity	Value	Quantity	Value
		$		$
NOVA SCOTIA (Bituminous)	6,743,504	27,427,556	7,056,133	28,071,956
NEW BRUNSWICK (Bituminous)	207,738	869,104	218,706	909,169
SASKATCHEWAN (Lignite)	471,713	831,491	580,189	993,226
ALBERTA—				
Bituminous	3,215,494	11,190,180	3,094,147	10,851,499
Sub-bituminous	740,496	2,076,212	668,702	1,908,954
Lignite	3,380,340	10,266,022	3,387,844	10,167,729
Total	7,336,330	23,532,414	7,150,693	22,928,182
BRITISH COLUMBIA (Bituminous)	2,804,594	11,094,353	2,490,378	10,160,789
YUKON (Bituminous)	414	2,915	458	1,848
CANADA—				
Bituminous	12,971,744	50,584,108	12,859,822	49,995,261
Sub-bituminous	740,496	2,076,212	668,702	1,908,954
Lignite	3,852,053	11,097,513	3,968,033	11,160,955
Total	17,564,293	63,757,833	17,496,557	63,065,170

(4)—Disposition of Coal from Canadian Mines by Provinces, 1929 (Short tons)

	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
Supplied to employees for domestic consumption	129,840	3,400	3,779	45,490	22,059	13	204,581
Coal shipped. (See Table 10)	6,363,984	207,904	459,302	6,713,906	2,078,818	221	15,824,135
Used under colliery boilers, etc.	365,492	6,294	32,100	244,139	147,635	3	795,663
Used by companies' railroads	48,424	1,102	4,866	7,595	13,717	....	75,704
Used for manufacture of coke at colliery	....	....	....	....	115,482	....	115,482
Used in making briquettes	....	....	79,455	26,180	....	....	105,635
Used in shops, etc.	108,509	....	....	....	....	....	108,509
Used by harbour tugs and dredges	724	....	....	....	....	....	724
Put on bank	855,026	20,740	2,605	61,183	66,943	....	1,006,497
Put on waste heap	14,844	53	614	110,179	109,373	221	235,284
Total disposition	**7,886,843**	**239,493**	**582,721**	**7,208,672**	**2,554,027**	**458**	**18,472,214**
Lifted from bank	830,710	20,787	2,532	57,979	63,649	....	975,657
Total output	**7,056,133**	**218,706**	**580,189**	**7,150,693**	**2,490,378**	**458**	**17,496,557**

(5)—Principal Statistics of the Coal Mining Industry in Canada, 1921-1929

Year	Number of mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Selling value of products
		$		$	$	$
1921	396	174,089,342	31,849	46,475,709	(a) 3,795,151	72,451,656
1922	509	140,466,108	31,838	39,550,627	(a) 3,183,642	65,518,497
1923	507	143,447,448	32,046	46,215,712	4,756,308	72,058,986
1924	520	146,711,531	27,183	35,123,490	4,358,987	53,593,988
1925	511	145,006,440	25,032	33,200,309	4,069,634	49,261,951
1926	457	148,278,315	28,368	35,841,796	4,631,691	59,875,094
1927	437	146,392,808	29,772	38,955,967	3,558,926	61,867,463
1928	427	146,835,825	30,256	43,320,811	3,679,721	63,757,833
1929	413	141,766,727	29,739	42,376,378	3,657,355	63,065,170

(a) Fuel only.

(6)—Principal Statistics of the Coal Mining Industry in Canada, by Provinces, 1928-1929

Year	Number of mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Selling value of products
		$		$	$	$
—1928—						
Nova Scotia	40	57,247,450	13,857	19,940,690	2,106,319	27,427,556
New Brunswick	15	1,645,304	612	602,247	41,945	869,104
Saskatchewan	58	3,971,302	541	541,894	33,543	831,491
Alberta	279	56,337,899	9,925	14,644,547	805,986	23,532,414
British Columbia	34	27,430,870	5,317	7,590,153	691,903	11,094,353
Yukon	1	203,000	4	1,280	25	2,915
Canada	427	146,835,825	30,256	43,320,811	3,679,721	63,757,833
—1929—						
Nova Scotia	36	55,805,527	13,324	19,846,914	2,159,604	28,071,956
New Brunswick	11	1,656,663	605	593,781	30,714	909,169
Saskatchewan	58	3,996,718	592	600,695	42,602	993,226
Alberta	281	56,073,084	10,147	14,605,197	789,970	22,928,182
British Columbia	26	24,031,735	5,068	6,728,591	634,450	10,160,789
Yukon	1	203,000	3	1,200	15	1,848
Canada	413	141,766,727	29,739	42,376,378	3,657,355	63,065,170

(7)—Output, Imports, Exports and Coal Made Available for Consumption in Canada, 1928 and 1929 (short tons)

	1928	1929
OUTPUT	17,564,293	17,496,557
IMPORTS	17,714,296	18,619,300
TOTAL	35,278,589	36,115,857
LESS EXPORTS	863,941	842,972
COAL AVAILABLE FOR CONSUMPTION	34,414,648	35,272,885

(8)—Imports of Coal into Canada by Kinds and by Provinces, 1929 (short tons)

Province	ANTHRACITE COAL			Bituminous Coal	Lignite Coal	TOTAL COAL
	Egg, Nut, Etc.	Dust	TOTAL			
Prince Edward Island	6,344	836	7,180	8,982	....	16,162
Nova Scotia	63,908	....	63,908	36,144	....	100,052
New Brunswick	108,148	2,366	110,514	76,108	....	186,622
Quebec	1,374,377	154,709	1,529,086	1,335,197	....	2,864,283
Ontario	2,142,674	156,413	2,299,087	13,067,713	....	15,366,800
Manitoba	6,701	2,479	9,180	38,801	1,896	49,877
Saskatchewan	365	....	365	2,477	41	2,883
Alberta	....	....	....	1,327	....	1,327
British Columbia	596	1	597	18,459	12,171	31,227
Yukon	....	....	....	67	....	67
CANADA	3,703,113	316,804	4,019,917	14,585,275	14,108	18,619,300

(9)—Imports of Coal into Canada by Kinds and by Sources, 1929 (short tons)

Source	ANTHRACITE COAL			Bituminous Coal	Lignite Coal	TOTAL COAL
	Egg, Nut, Etc.	Dust	TOTAL			
United States	2,864,096	308,947	3,173,043	14,469,831	14,108	17,656,982
Great Britain	721,601	7,857	729,458	115,368	....	844,826
Russia	117,304	....	117,304	....	....	117,304
Japan	112	....	112	....	....	112
Newfoundland	....	....	....	76	....	76
TOTAL	3,703,113	316,804	4,019,917	14,585,275	14,108	18,619,300

(10)—Exports of Coal from Canada, by Destinations, 1929

Destination	Short tons	Value $
United States	451,516	2,080,807
Newfoundland	269,168	1,426,701
Great Britain	26,605	195,958
Alaska	21,642	152,663
Australia	19,225	159,409
British South Africa	12,089	74,057
New Zealand	6,752	34
Other countries	35,975	243,899
TOTAL	842,972	4,375,328

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